NETWORK POWER MONITOR R8 / NPM-R8

SNMP+DHCP
MDI/MDIX

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ELECTRONIC DEVELOPMENT
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Innovative Electronics for a Changing World

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9. SNMP CONFIGURATION PAGE – (SNMP)
10. TFTP Boot-loader – firmware upgrade via Ethernet

MODELS :

12-24Vdc / 30Amp

12-48Vdc / 30Amp

12-24Vdc / 100Amp

12-48Vdc /100Amp

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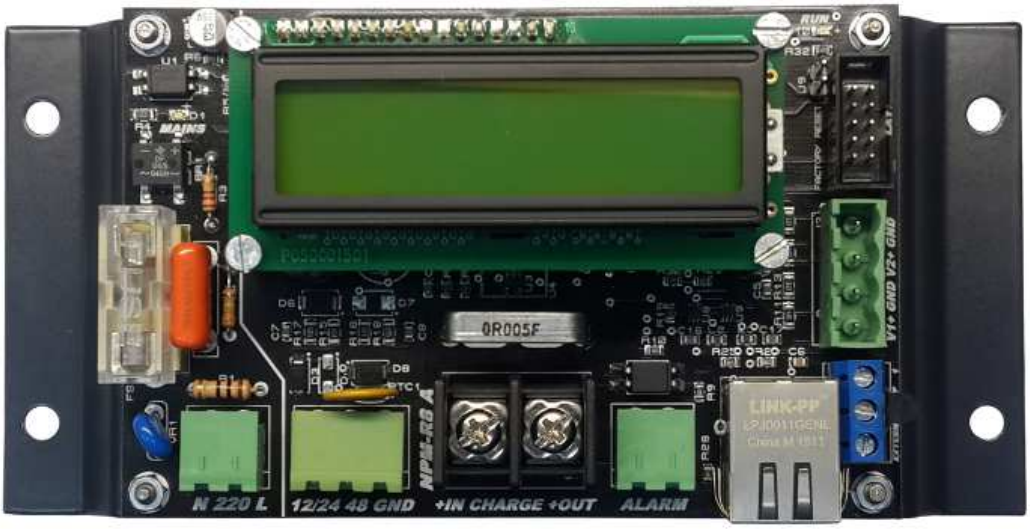
1 SYSTEM DESCRIPTION

Main Board



Relay Board

The NPM-R8 (NETWORK POWER MONITOR R8) was designed to assist Network and Wireless Network specialists with Power related information via Ethernet Communication.

Battery Voltage, Charging Current, Mains 220Vac Status, 2x External dc input voltages, Alarm input and temperature information is available.

Embedded Web pages for monitoring and configuration of the system.

The unit supports the SNMP V1 and SNMP V2C communication platform to be compatible with MIB Browsers (SNMP monitoring software platforms). Unit supports **DHCP**.

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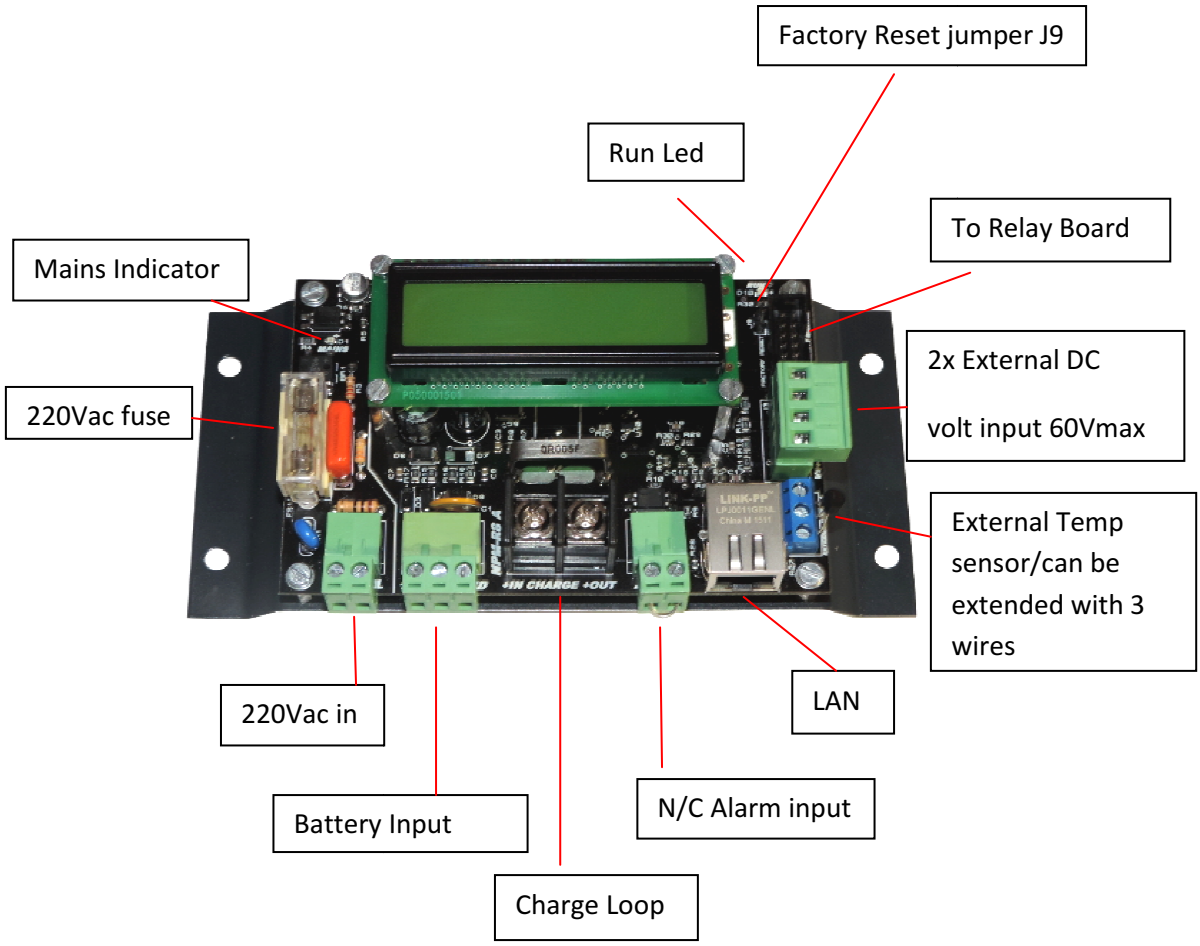
The Ethernet port supports MDI/MDIX auto select for straight and crossover cables

The NPM-R8 is powered by C language firmware and the code was written to function as a co-operative RTOS.(Real time operating system)

2 BOARD CONNECTIONS



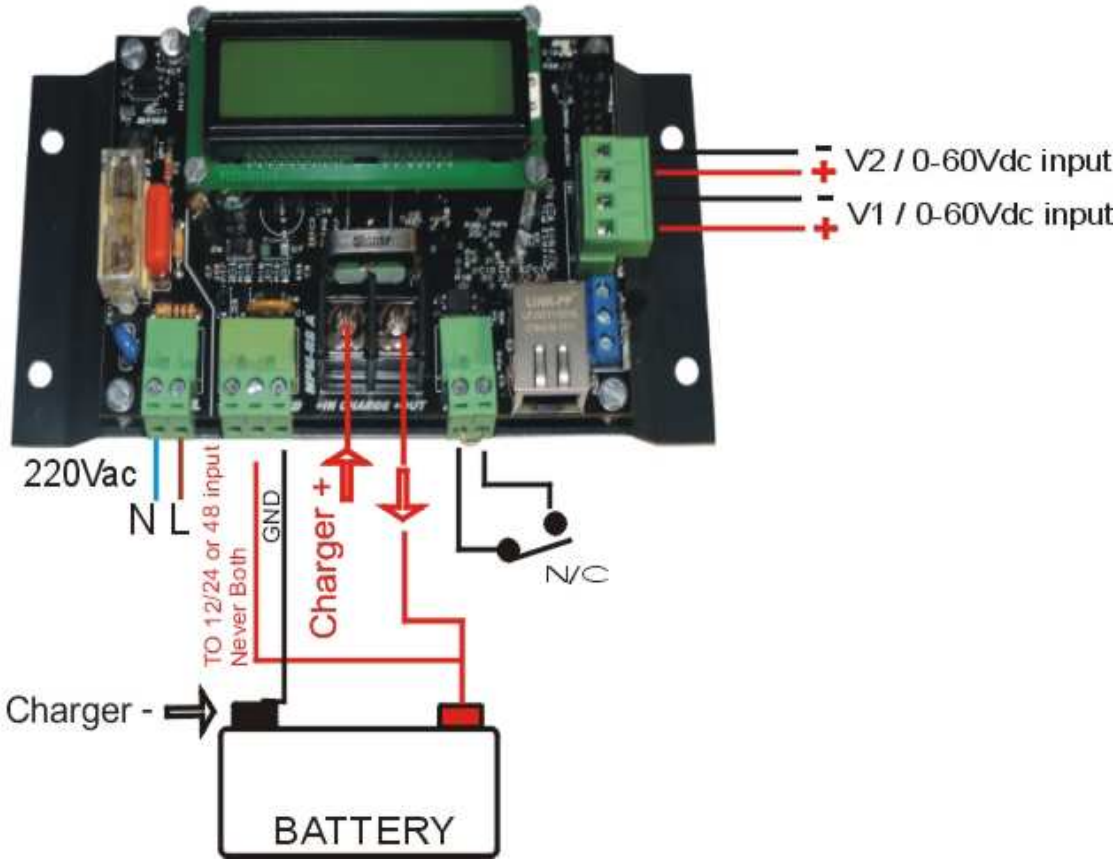
Relay Board connector pin 1 marked with △

Factory Reset jumper next to relay board connector – J9 – insert jumper – power up and wait until green led top left corner of Main board flash onces.

External Temperature sensor can be extended with 2 wires (10K NTC Thermistor)

Alarm input – potential free contact only.

3 CONNECTION DIAGRAM



V1 and V2 External Vdc inputs can be used to monitor eg. DC-DC converters.

Also note that the V1 and V2 external power input GND terminal is common with the GND of the system.

Use only one Battery voltage input at a time,12-24V or 48V never both

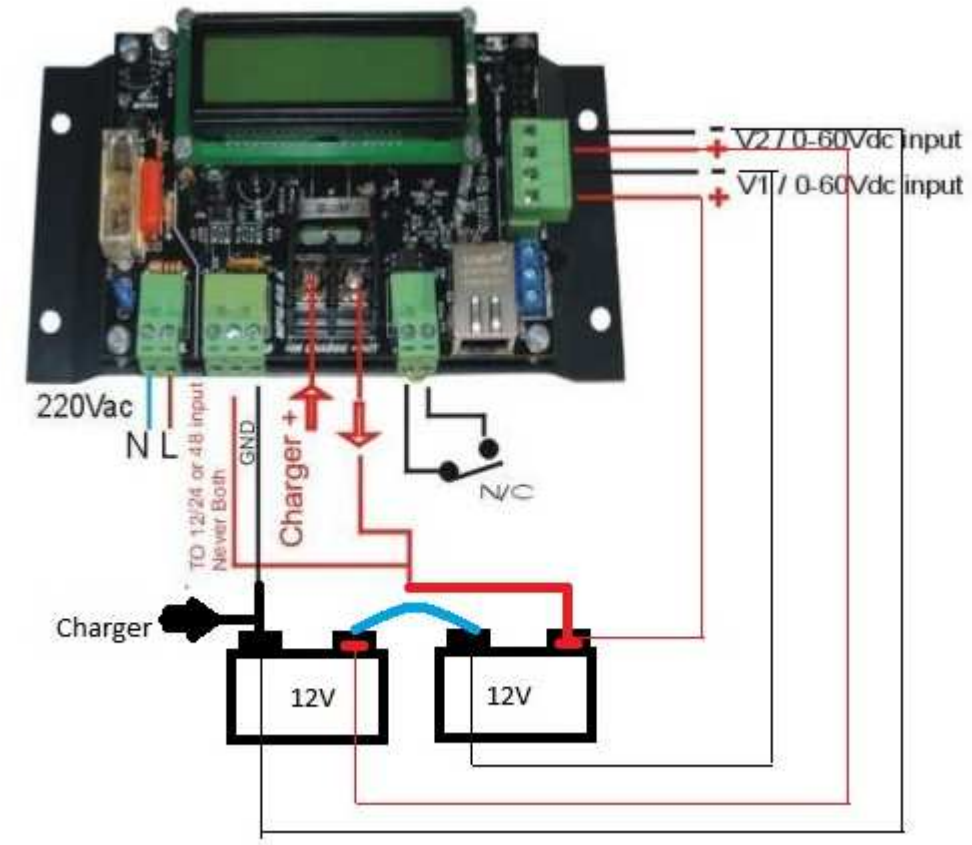
Depending on the model used, connect 12 to 24 v Dc systems only to the first terminal marked 12/24 and for 48Vdc systems only to the 48 terminal.

Battery Input terminal 12/24 and 48v protected by TVS diode and electronic fuse for surge voltages.

External V1 and V2 inputs protected by TVS diode for spikes and surge voltages.

DO NOT CONNECT IN THIS WAY !

The centre tap with blue line in drawing becomes a OV terminal with a +12V on the one side of the battery pack and a – 12V on the other side. (the unit can tolerate minus voltages below Ground and damage to the unit will occur)



4 START UP

By default the unit is shipped with DHCP enabled with a default IP address of

192.168.1.2

Micro Instruments Network Power Monitor R8 will be display where after the current TCPIP stack version will be displayed.

192.168.1.2 will appear on the LCD as the default IP address , if the board is connected to a DHCP enabled network host the address should change as soon as the DHCP address is received from the host and will be re displayed as the new IP address.

Connect to the IP address via a web browser (Tested Google Chrome and Internet Explorer) to access the web pages.

To Factory reset the unit, install the jumper provided over J9 next to the relay board 10way connector, power the unit, Display will show model number etc and then go blank, notice the run led close to the jumper J9 will give one flash as soon as the board is restored to factory settings. Cycle the power to the board to initiate a restart.

The MIB file for the NPM-R8 can be downloaded from www.microinstruments.co.za

The MIB file can be imported to an SNMP monitoring program to help identify the OID's received from the NPM-R8.

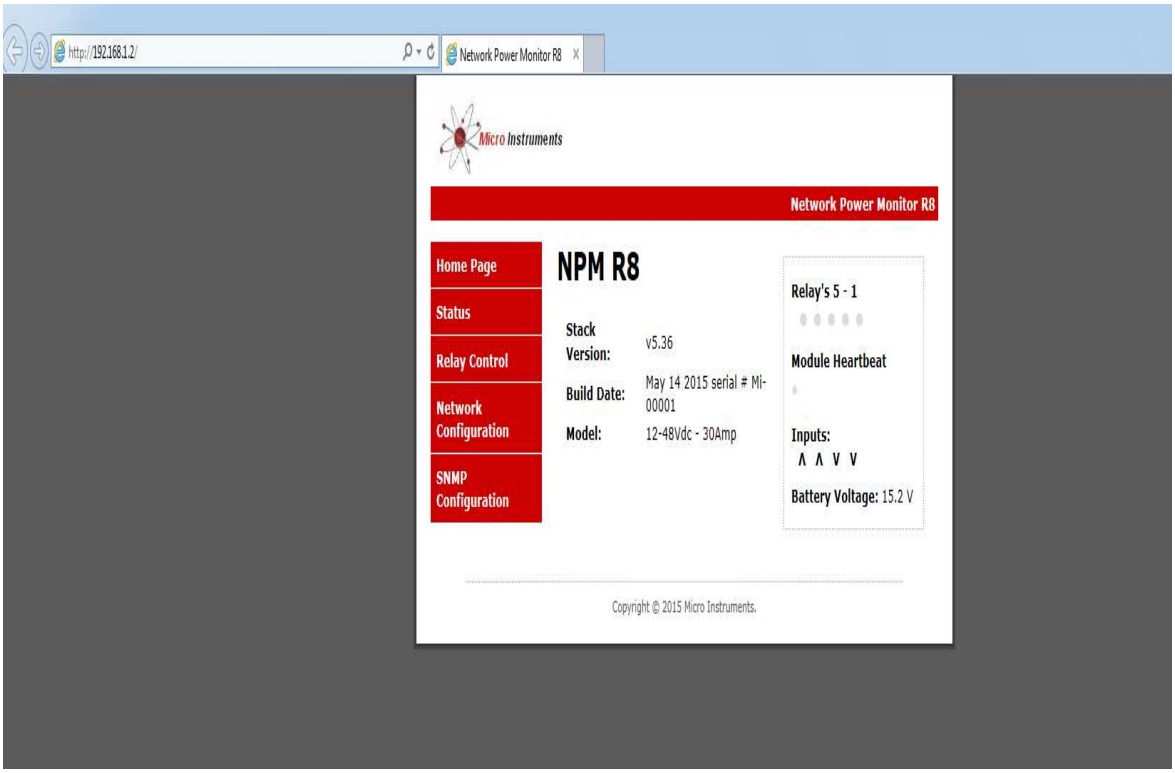
Micro Instruments registered private enterprise number (PEN) 45501

To login to the Relay control page , Network settings or SNMP configuration pages the following must be used.

admin

microi

5 HOME PAGE



The Stack version is displayed, the build date of the firmware programmed on to the device, the units serial number as well as the model number.

A visual indication of the status of Relays 5 to 1 is given and indicated by a green dot if the relay is active (powered)

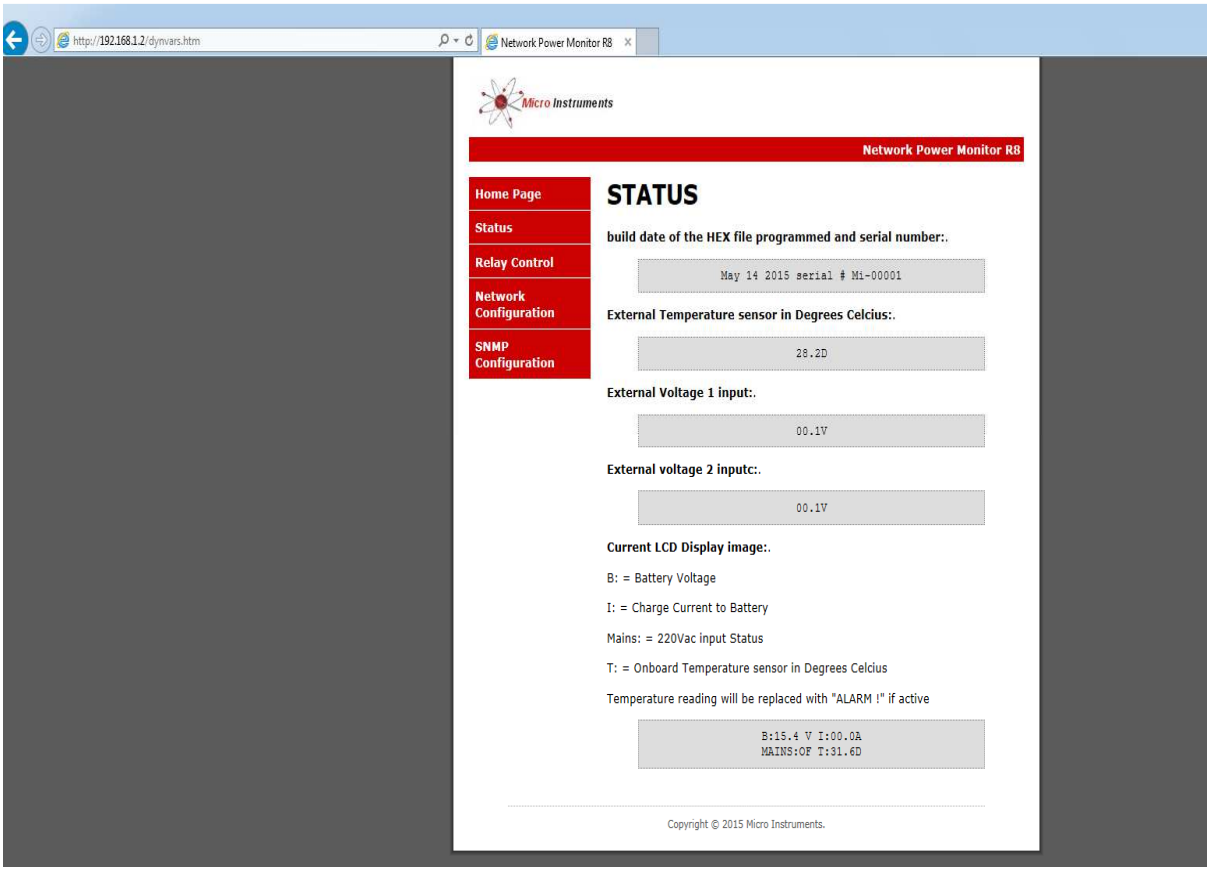
A “module heartbeat” indication by a green dot flashes once per second as the software runs through the TCPIP applications.

Only inputs 1 and 2 is functional, and indicated by a ^ for inactive and V for active, inputs 3 and 4 is for future expansion.

Rapid Battery voltage measurements is displayed for quick information regarding battery voltage.

Left hand menu will navigate to different applications on the unit.

6 STATUS PAGE



Manufacturing date and serial number is displayed.

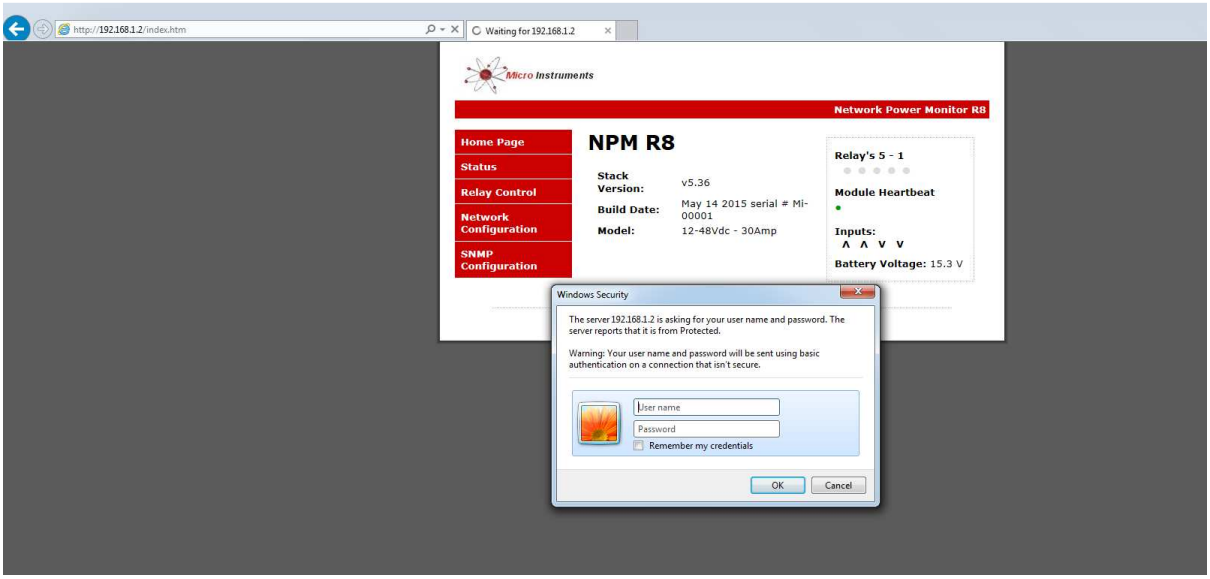
External temperature sensor is displayed in degrees Celsius.

External Voltage input V1 and V2 is displayed as 0 to 60Vdc

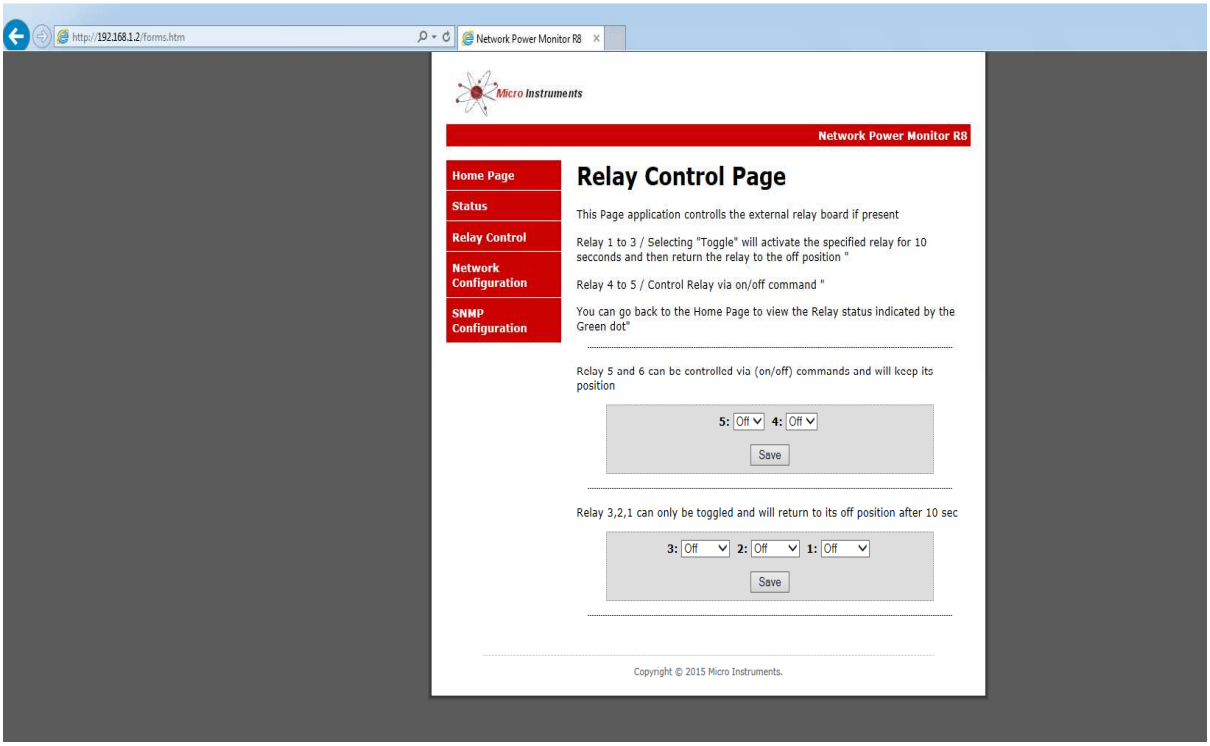
A reflection of the module's LCD display is captured and displayed on this page

Battery voltage , charge current , Mains status on or off and the on board temperature sensor .

7 RELAY CONTROL PAGE

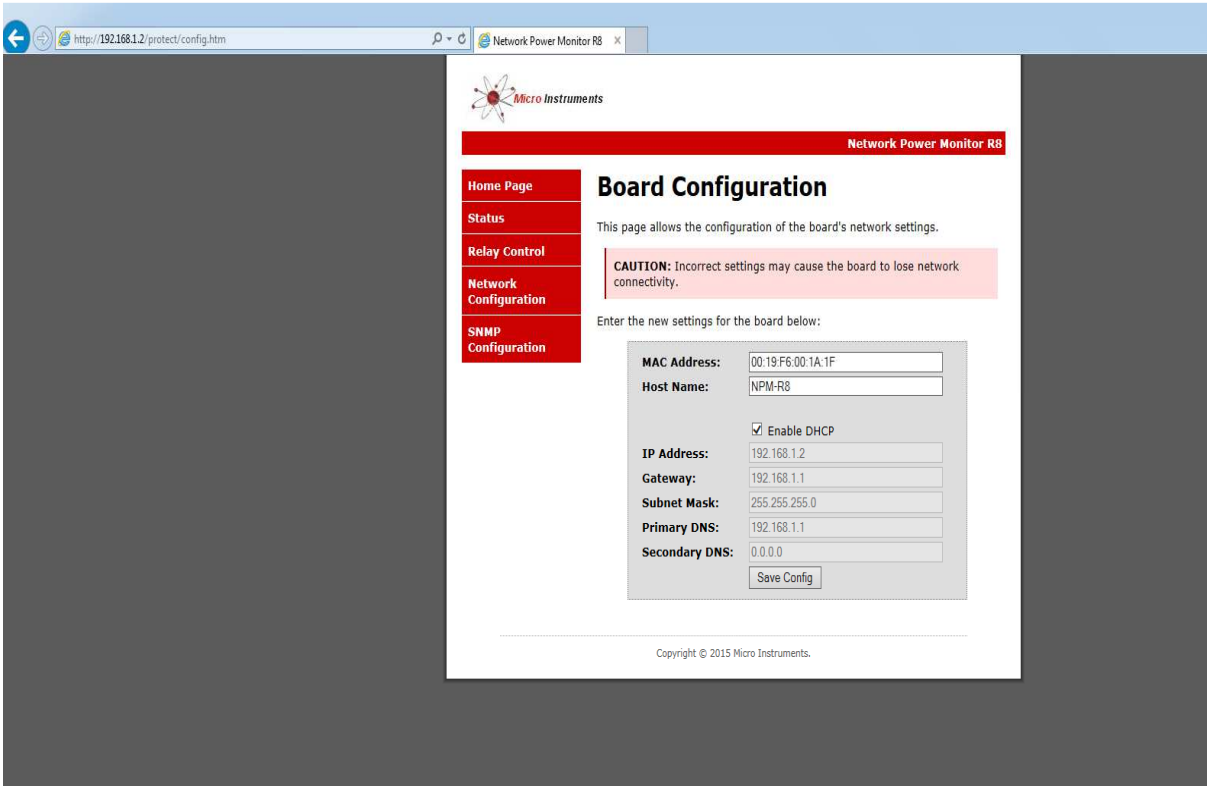


Admin and microi gains access


http://192.168.1.2/forms.htm
Network Power Monitor R8
Micro Instruments
Network Power Monitor R8
Home Page
Status
Relay Control
Network Configuration
SNMP Configuration
Relay Control Page
This Page application controlls the external relay board if present
Relay 1 to 3 / Selecting "Toggle" will activate the specified relay for 10 secconds and then return the relay to the off position "
Relay 4 to 5 / Control Relay via on/off command "
You can go back to the Home Page to view the Relay status indicated by the Green dot"
Relay 5 and 6 can be controlled via (on/off) commands and will keep its position
5: Off 4: Off
Save
Relay 3,2,1 can only be toggled and will return to its off position after 10 sec
3: Off 2: Off 1: Off
Save
Copyright © 2015 Micro Instruments.

Relay 5 and 4 can be controlled to the on/off status and will keep their positions, Relay 3 to 1 can only be toggled for 10 second periods and is typically used to reset radios or routers without logging yourself out completely from the remote site after a relay was accidently switched , relay 3 to 1 will return automatically after 10 seconds to the off position (relay not powered)

8 NETWORK CONFIGURATION PAGE



Admin and microi gains access

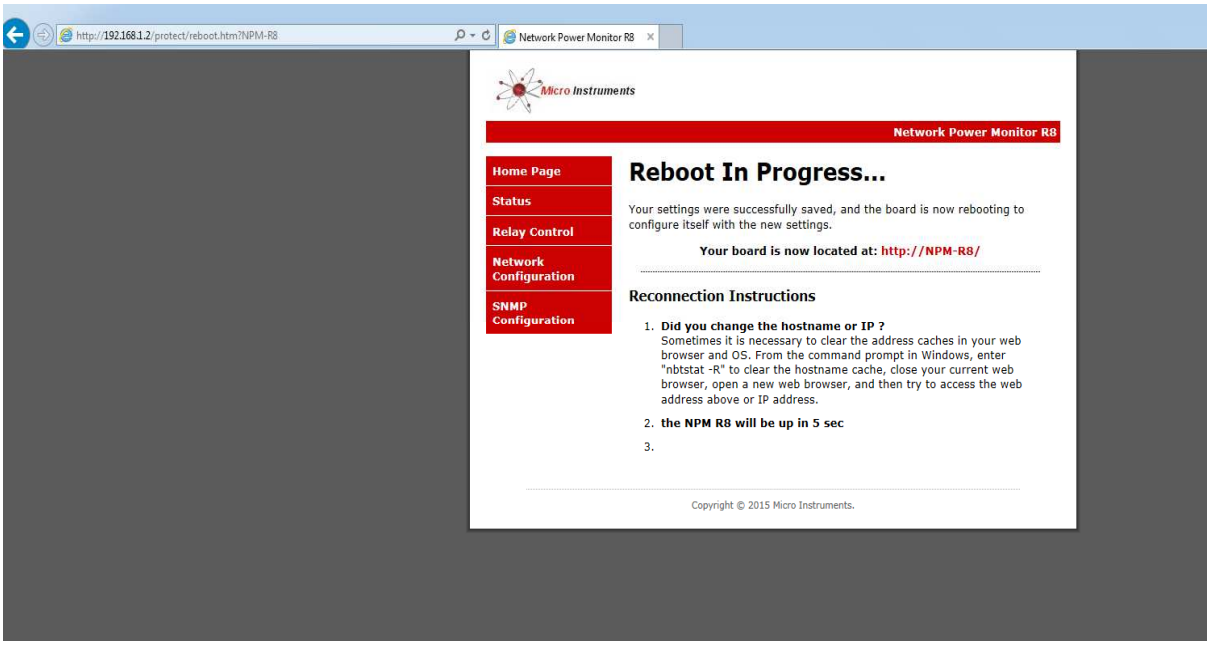
MAC address is displayed and cannot be changed

DHCP enable or disable function will grey out IP settings if active or give user rights to change settings if DHCP is disabled.

Setup IP address, Gateway and Subnet Mask

Primary DNS and Secondary DNS is not functional and is reserved for future use.

Save Config

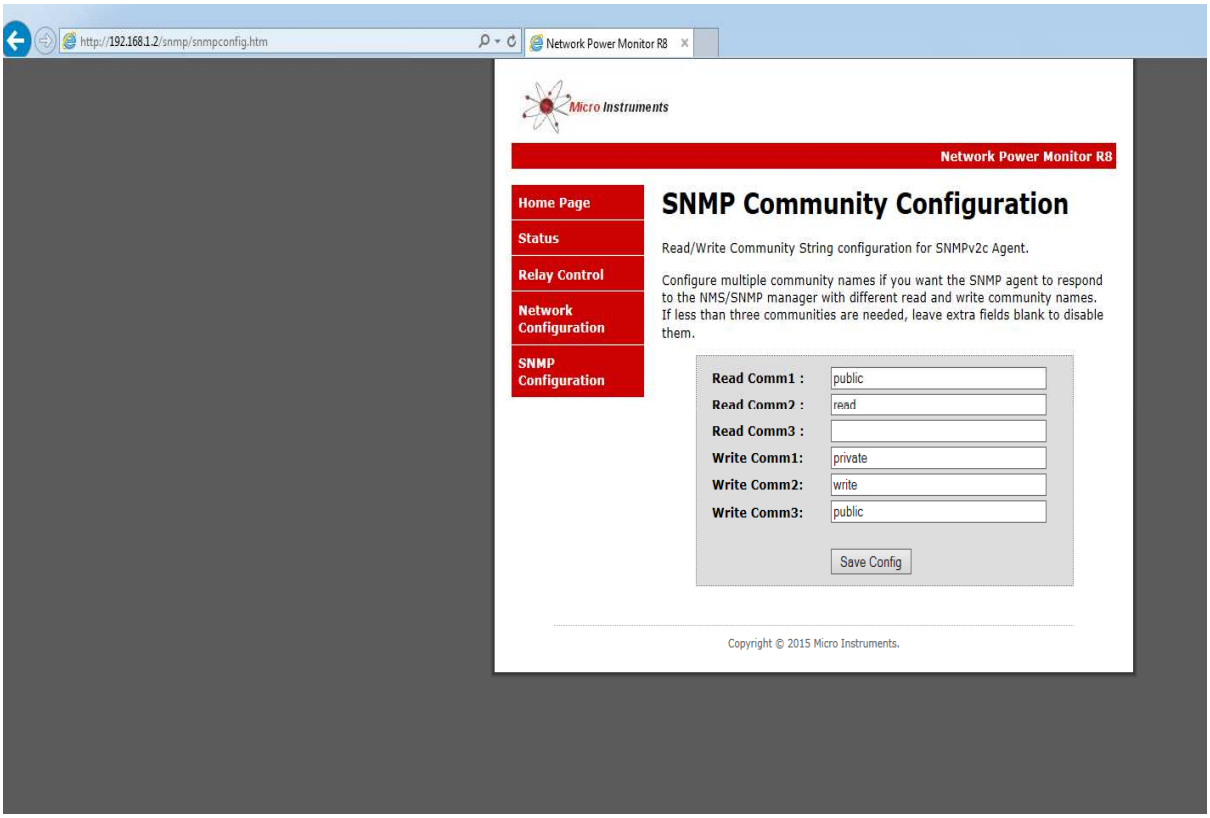

http://192.168.1.2/protect/reboot.htm?NPM-R8
Network Power Monitor R8
Micro Instruments
Network Power Monitor R8
Home Page
Status
Relay Control
Network Configuration
SNMP Configuration
Reboot In Progress...
Your settings were successfully saved, and the board is now rebooting to configure itself with the new settings.
Your board is now located at: http://NPM-R8/
Reconnection Instructions
1. Did you change the hostname or IP ?
Sometimes it is necessary to clear the address caches in your web browser and OS. From the command prompt in Windows, enter "nbtstat -R" to clear the hostname cache, close your current web browser, open a new web browser, and then try to access the web address above or IP address.
2. the NPM R8 will be up in 5 sec
3.
Copyright © 2015 Micro Instruments.

After the configuration was saved the " Reboot in Progress" page will load

The unit will reboot and configure and should be live in maximum 5 seconds

Information on how to clear Browser cache is also given

9 SNMP Configuration

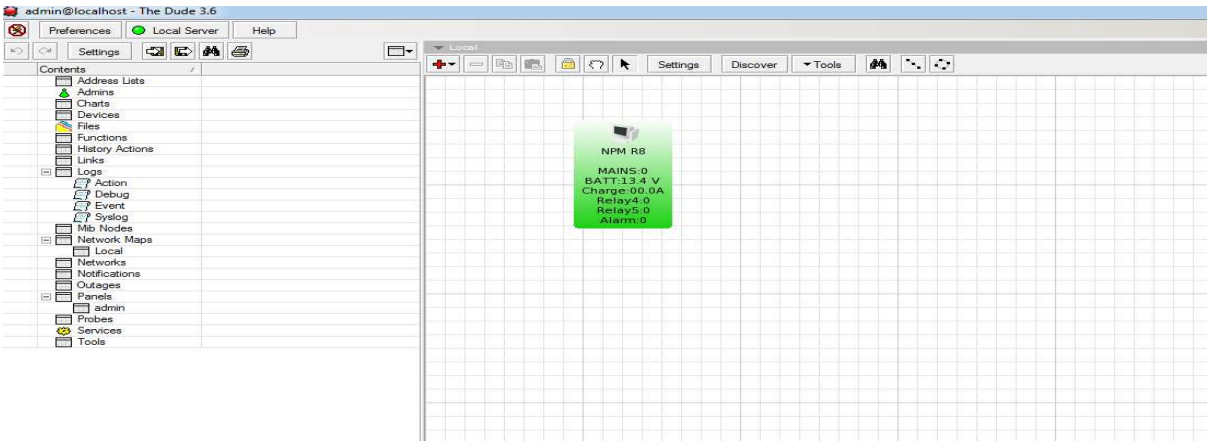

http://192.168.1.2/snmp/snmpconfig.htm
Network Power Monitor R8
Micro Instruments
Network Power Monitor R8
Home Page
Status
Relay Control
Network Configuration
SNMP Configuration
SNMP Community Configuration
Read/Write Community String configuration for SNMPv2c Agent.
Configure multiple community names if you want the SNMP agent to respond to the NMS/SNMP manager with different read and write community names. If less than three communities are needed, leave extra fields blank to disable them.
Read Comm1 : public
Read Comm2 : read
Read Comm3 :
Write Comm1: private
Write Comm2: write
Write Comm3: public
Save Config
Copyright © 2015 Micro Instruments.

Admin and microi gains access.

Configure read and write communities

Write communities is functional on the device via SNMP SET and GET functions but is beyond the scope of this user manual as the relay's can also be controlled via the relay control page.

SNMP screenshot from “the dude” freeware SNMP manager



SNMP V2c /SNMP walk screenshot

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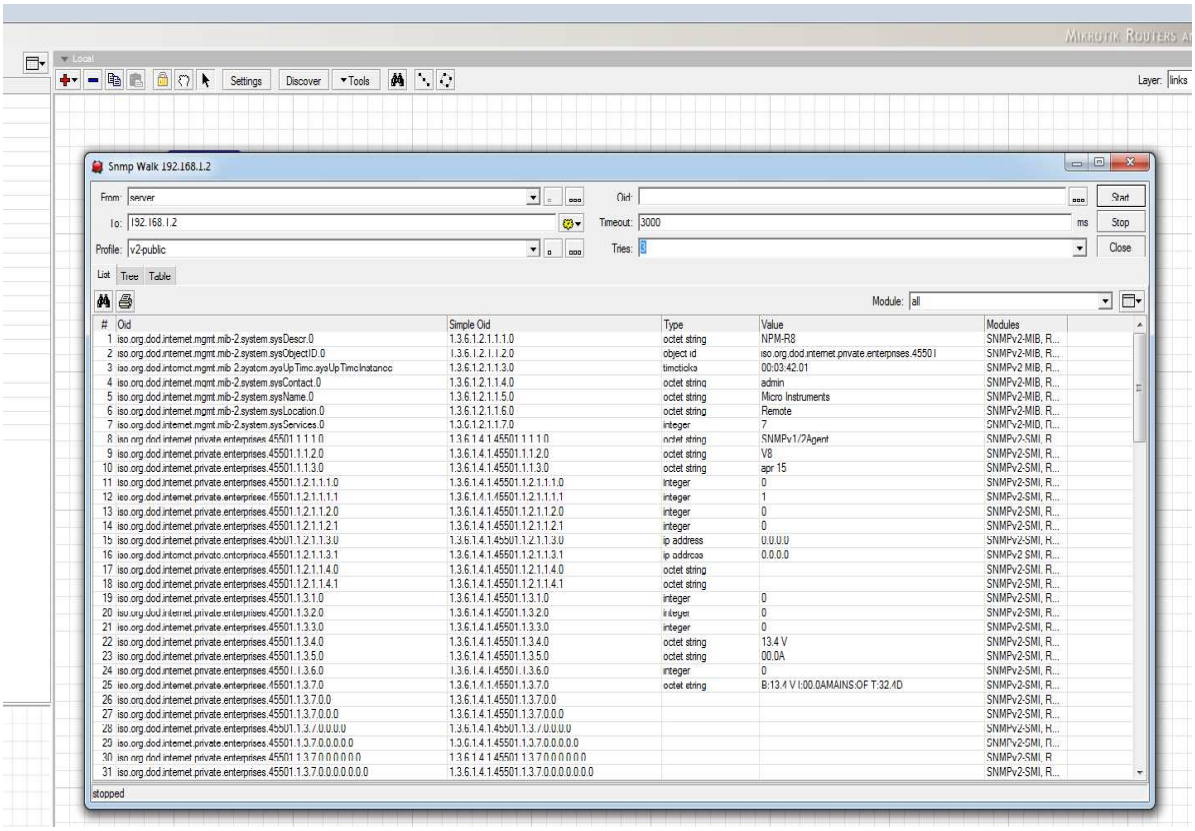


OID table / number of services = 10

45501.**1.3.1.0 = Relay 4 status (integer) 0 off / 1 on**

45501.**1.3.2.0 = Relay 5 status (integer) 0 off/1 on**

45501.**1.3.3.0 =Mains status (integer) 0 off / 1 on**

45501.**1.3.4.0 = Battery voltage (octet string)**

45501.**1.3.5.0 = Charge current (octet string)**

45501.**1.3.6.0 = External Temperature sensor (octet string)**

45501.**1.3.7.0 = External DC Volts V1 (octet string)**

45501.**1.3.8.0 = External DC Volts V2 (octet string)**

45501.**1.3.9.0 = Alarm status (integer) 0 off/ 1 on or active**

45501.**1.3.10.0 = LCD display text string (octet string)**

To add a device to the Dude and add all settings

In the top screen Click on + and click on device to add a device, enter the device IP and click next and finish , right click on the device icon, select appearance in the drop down menu, double click in the Label: window and copy and paste the code below to the label window.

[Device.Name]

[device_performance()][Device.ServicesDown]

copy it in below the above text that appears automatically*

MAINS:[oid("1.3.6.1.4.1.45501.1.3.3.0")]

BATT:[oid("1.3.6.1.4.1.45501.1.3.4.0")]

Charge:[oid("1.3.6.1.4.1.45501.1.3.5.0")]

Relay4:[oid("1.3.6.1.4.1.45501.1.3.1.0")]

Relay5:[oid("1.3.6.1.4.1.45501.1.3.2.0")]

Temp:[oid("1.3.6.1.4.1.45501.1.3.6.0")]

EXTV1:[oid("1.3.6.1.4.1.45501.1.3.7.0")]

EXTV2:[oid("1.3.6.1.4.1.45501.1.3.8.0")]

Alarm:[oid("1.3.6.1.4.1.45501.1.3.9.0")]

Select label refresh value to 5 or 10sec

Click on arrow next to up (green) partially down(orange) and down(Red) to display colours

Click apply and OK

Right click the new created icon again and select settings

Give a Name to the unit that makes sense to the user and select SNMP profile as V2 public

Go to polling and select your probe interval and Probe timeout time

Click on apply

Under services click the + sign

Under Probe: select ping and apply and ok

At this time the Icon for the device should be Green and indicating all values.

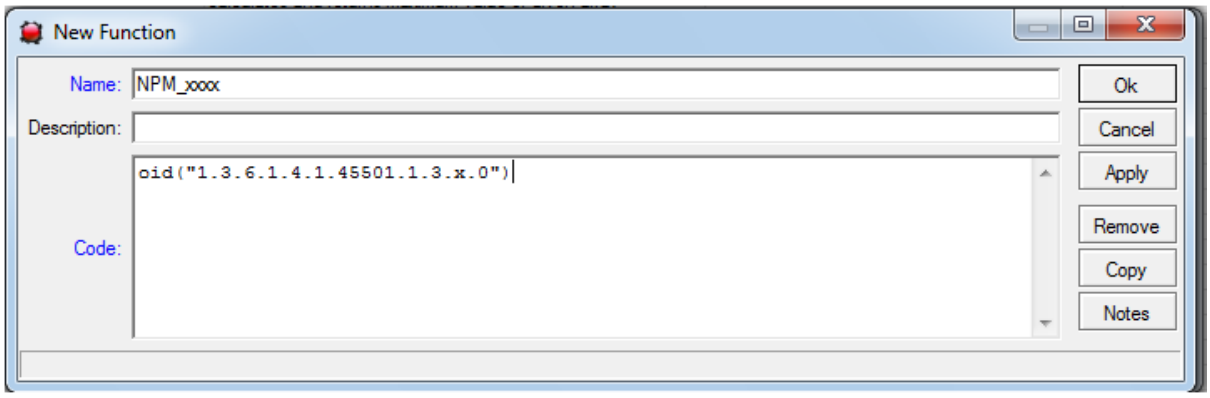
Add a probe and function to the dude for Mains failure

To be notified by the Dude for a change in mains status or alarm add a function and a probe

In the right hand side navigation window of the Dude double click Functions

Click the + sign to add a function

Type the Name as **NPM_Mains**



Copy and paste the text below as above (note the OID is the Mains OID)

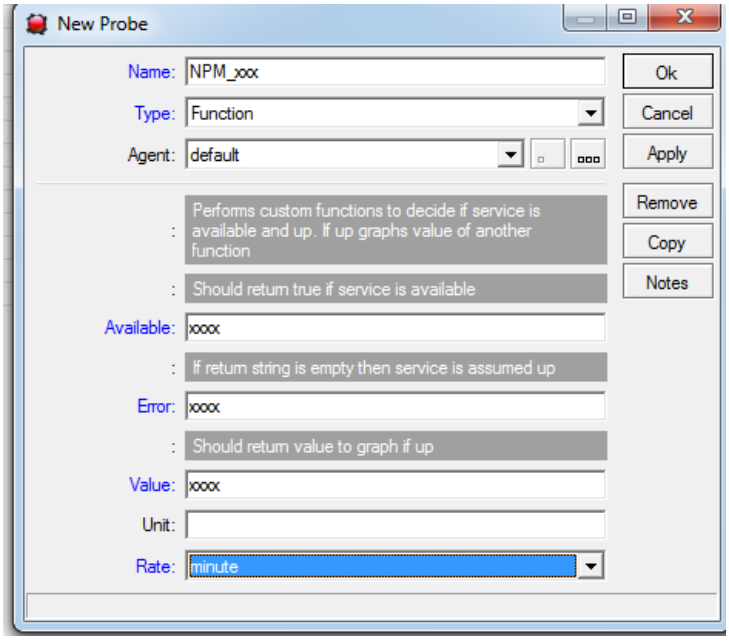
oid("1.3.6.1.4.1.45501.1.3.3.0")

Click apply and ok

In the right hand side navigation window of the Dude double click Probes

Click the + sign to add a Probe

Under Probes create a new probe:



Type the name exactly as the function created earlier - : **NPM_Mains**

Change Type to **: Function**

Agent: **default**

Copy and paste the text below one by one and insert

Available: NPM_Mains()

Error: if(NPM_Mains()=1, "", "Mians OFF")

Value: NPM_Mains()

Leave **Unit** blank

Rate: **minute**

Click Apply and ok

Right click the device icon on the monitoring screen and select **" Settings"**

Go To **services**

Click the + sign to add a service

Under Probe: select - NPM_Mains

Select the probe interval and probe timeout time and set the Probe down count to 1

Click apply and ok to exit

At this time switching the Mains power off to the unit will result in the monitoring Icon in the Dude to turn Orange and indicate at the top of the icon that it is a Mains failure that occurred.

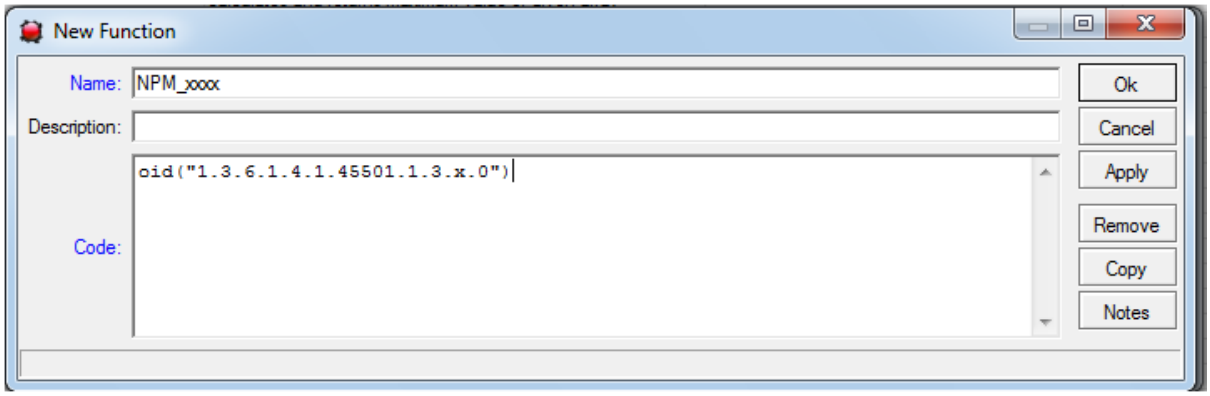
Add a probe and function to the dude for ALARM failure

To be notified by the Dude for a change in alarm status add a function and a probe

In the right hand side navigation window of the Dude double click Functions

Click the + sign to add a function

Type the Name as **NPM_Alarm**



Copy and paste the text below as above (note the OID is the ALARM OID)

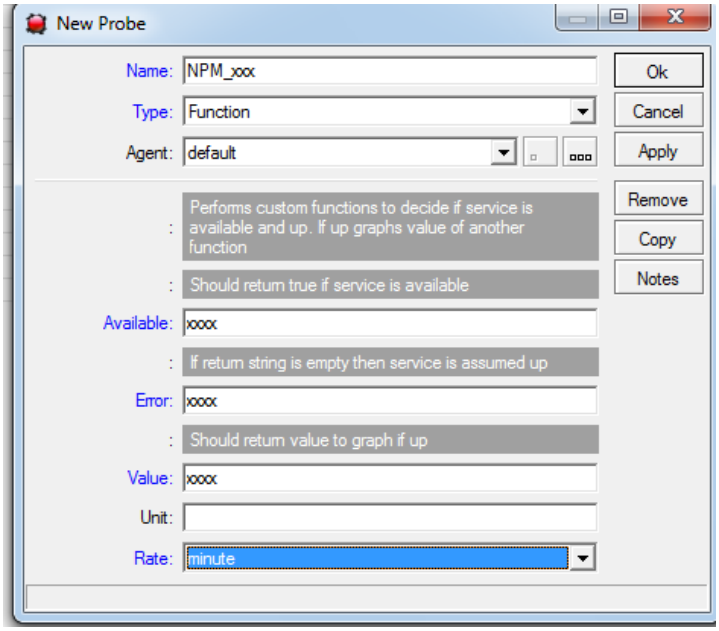
oid("1.3.6.1.4.1.45501.1.3.9.0")

Click apply and ok

In the right hand side navigation window of the Dude double click Probes

Click the + sign to add a Probe

Under Probes create a new probe:



Type the name exactly as the function created earlier - : **NPM_Alarm**

Change Type to **: Function**

Agent: **default**

Copy and paste the text below one by one and insert

Available: NPM_Alarm()

Error: if(NPM_Alarm()=0 , "", "Alarm OFF")

Value: NPM_Alarm()

Leave **Unit** blank

Rate: **minute**

Click Apply and ok

Right click the device icon on the monitoring screen and select **" Settings"**

Go To **services**

Click the + sign to add a service

Under Probe: select - NPM_Alarm

Select the probe interval and probe timeout time and set the Probe down count to 1

Click apply and ok to exit

At this time Activating the Alarm input to the unit will result in the monitoring Icon in the Dude to turn Orange and indicate at the top of the icon that it is a active Alarm that occurred.

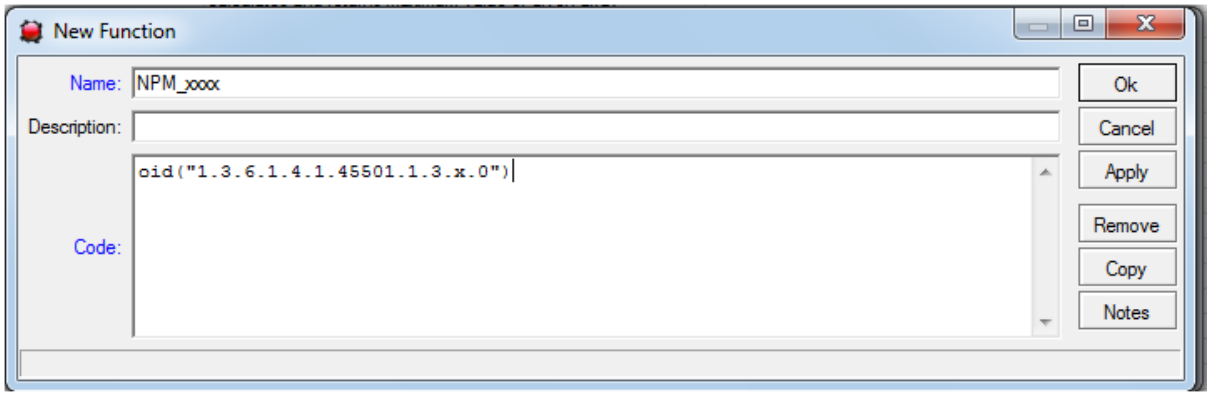
Add a probe and function to the dude for low Battery Voltage

To be notified by the Dude for a change in low Battery status add a function and a probe

In the right hand side navigation window of the Dude double click Functions

Click the + sign to add a function

Type the Name as **NPM_Volts**



Copy and paste the text below as above (note the OID is the Battery voltage OID)

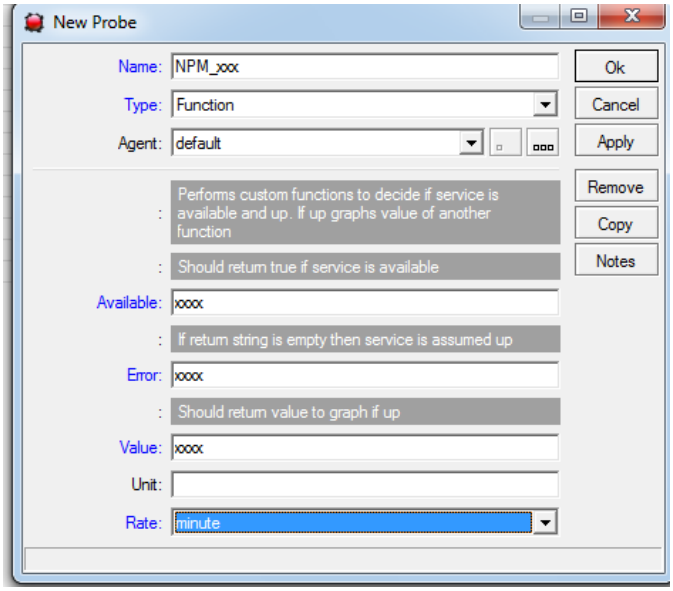
oid("1.3.6.1.4.1.45501.1.3.4.0")

Click apply and ok

In the right hand side navigation window of the Dude double click Probes

Click the + sign to add a Probe

Under Probes create a new probe:



Type the name exactly as the function created earlier - : **NPM_Volts**

Change Type to **: Function**

Agent: **default**

Copy and paste the text below one by one and insert

Available: NPM_Volts()

Error: if(NPM_Volts() > 11.5, "", "BATT LOW")

YOU can change your battery low level in decimal , currently at 11.5V

Value: NPM_Volts()

Leave **Unit** blank

Rate: **minute**

Click Apply and ok

Right click the device icon on the monitoring screen and select **" Settings"**

Go To **services**

Click the + sign to add a service

Under Probe: select - NPM_Volts

Select the probe interval and probe timeout time and set the Probe down count to 1

Click apply and ok to exit / At this time lowering the Battery input voltage to the unit will result in the monitoring Icon in the Dude to turn Orange and indicate at the top of the icon that it is a low battery condition.

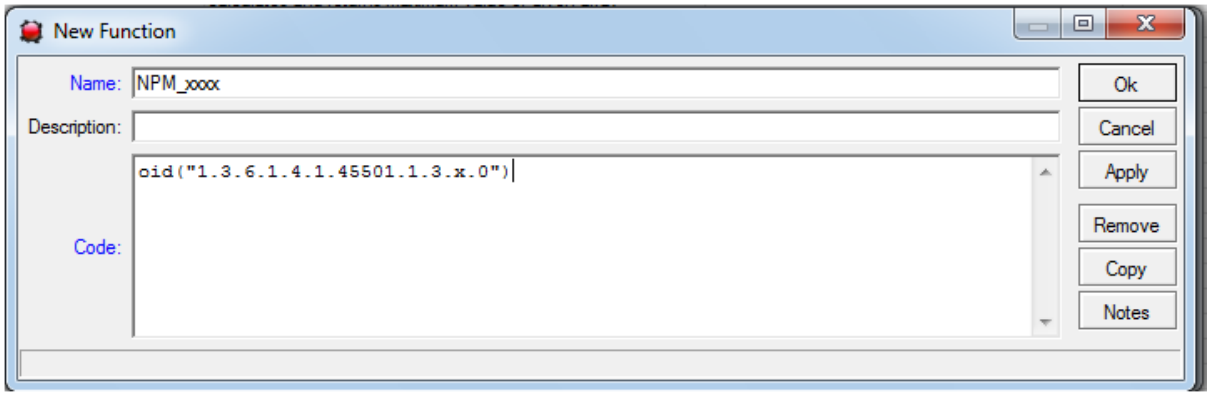
Add a probe and function to the dude for Charge Current

To be able to Graph the charge current

In the right hand side navigation window of the Dude double click Functions

Click the + sign to add a function

Type the Name as **NPM_Charge**



Copy and paste the text below as above (note the OID is the Charge current OID)

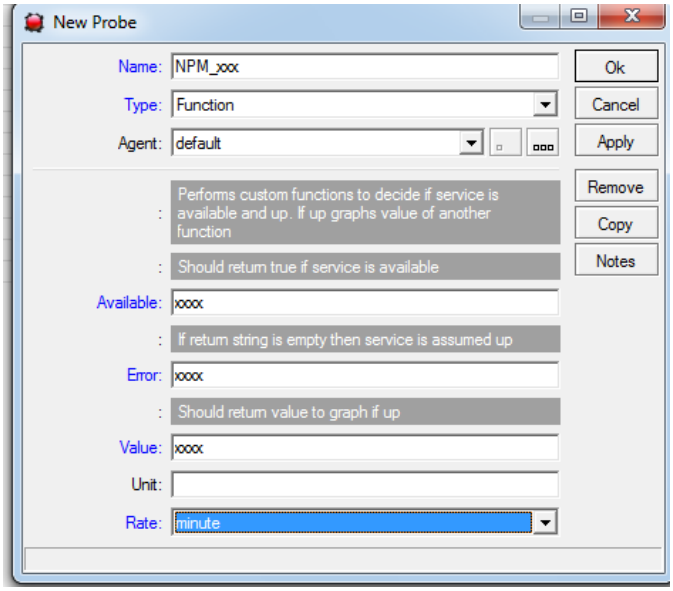
oid("1.3.6.1.4.1.45501.1.3.5.0")

Click apply and ok

In the right hand side navigation window of the Dude double click Probes

Click the + sign to add a Probe

Under Probes create a new probe:



Type the name exactly as the function created earlier - : **NPM_Amps**

Change Type to **: Function**

Agent: **default**

Copy and paste the text below one by one and insert

Available: NPM_Amps()

Error: if(NPM_Amps(), "", "")

Value: NPM_Amps()

Leave **Unit** blank

Rate: **minute**

Click Apply and ok

Right click the device icon on the monitoring screen and select **" Settings"**

Go To **services**

Click the + sign to add a service

Under Probe: select - NPM_Amps

Select the probe interval and probe timeout time and set the Probe down count to 1

Click apply and ok to exit / At this time we don't have an alarm on charge current but no it will Graph the charge data in your graph – it is possible to add a charge alarm - follow the low battery voltage alarm setup for the Charge amps to do create an alarm.

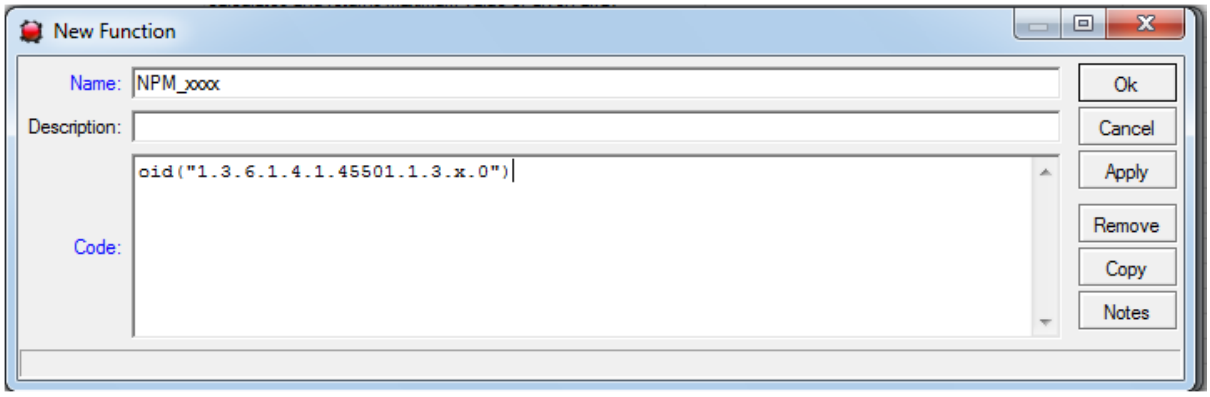
Add a probe and function to the dude for Over Temperature

To be notified by the DUDE of a Over temperature alarm.

In the right hand side navigation window of the Dude double click Functions

Click the + sign to add a function

Type the Name as **NPM_Temp**



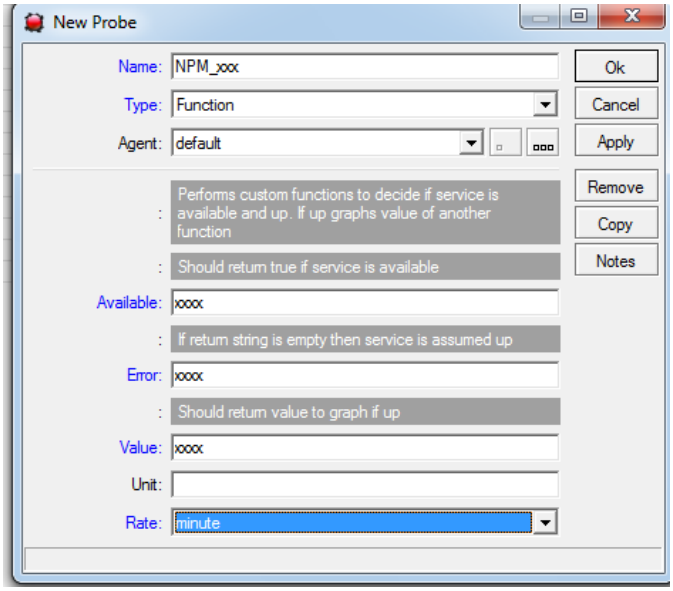
Copy and paste the text below as above (note the OID is the Temperature OID)

oid("1.3.6.1.4.1.45501.1.3.6.0")

In the right hand side navigation window of the Dude double click Probes

Click the + sign to add a Probe

Under Probes create a new probe:



Type the name exactly as the function created earlier - : **NPM_Temp**

Change Type to **: Function**

Agent: **default**

Copy and paste the text below one by one and insert

Available: NPM_Temp()

Error: if(NPM_Temp() < 40.0, "", "Over Temp")

CURRENTLY SET AT 40 deg C – you can change the value

Value: **NPM_Temp()*60** (ps! I had to *60 to get correct chart values however SNMP from NPM-R8 is continuously correct in SNMP walk and monitor icon)

Leave **Unit** blank

Rate: **minute**

Click Apply and ok

Right click the device icon on the monitoring screen and select **" Settings"**

Go To **services**

Click the + sign to add a service

Under Probe: select - NPM_Temp

Select the probe interval and probe timeout time and set the Probe down count to 1

Click apply and ok to exit / At this time the Icon will turn orange in case of a Over Temperature situation.

CREATE the Graphs in the DUDE

Right hand top left menu click on Charts

Click on the + sign to add a chart

Give the Chart a name that make sense to the user

Click on the + sign below to add services to the Dude

Select source in the window that have opened and select for instance the

NPM_Volts@ NPM as the source

Click on apply and ok

*** If you get a Error message " Unknown type" then please close the window to return to the previous window of Charts and Remove the Chart – you will be prompted with "Remove this Chart . Yes or No" Click yes to remove it , then click on the undo button top left corner of the dude screen to undo the Chart delete , you can now go back to the Chart and add the required data sources for Graphing to it

********** This is a Dude problem with V 3.6 **********

After all chart data sources was added like NPM_Volts@NPM and NPM_Amps@NPM the graphing of your voltage and charge current etc will start. You can add the temperature , mains status whatever you want to the graph

The scaling of the graphs might appear wrongly between a scale of 0 to 1 , after about 20min the graphing will be scaled between data received from unit.

SETTING UP EMAIL NOTIFICATIONS IN THE DUDE

Top left on screen click on **SETTINGS**

Add your Primary DNS address

Add your Primary SMTP address

Add your email address of this server

Click Apply and OK

Go to Notifications in the left tree menu

Select email by double click or add email if not present

In the email window add your To: email address and click test

If successful " OK " will appear in the bottom of the email window

Right click on the NPM icon on the local map(monitoring screen)

Go to services

Double click on the service you would like to receive an email from

Tick (enable) use notifications and select email in the list

Click apply

Also double check :

Right click NPM icon , go to settings , under Polling tab make sure use notifications an email is selected

9. TFTP Boot-loader

Units shipped from 10 August 2015 supports the TFTP software

NPM-R8 supports **TFTP** Boot-loader for upgrading device software remotely over a network.

The MAC address of the unit is hard coded into software for safety reasons so first obtain a .hex file from us for the specific unit.

Send e-mail to info@microinstruments.co.za , state **serial number** of unit (displayed on home page via web browser) and the **type of unit**
eg: NPM R8 , and the fault detected in software or why you need the software modified.

We will then send you a .hex file with the appropriate MAC address to be uploaded.

Simply download the **Mi – TFTP file up-loader** from our website

The Mi-TFTP file up-loader automatically insert the TFTP commands needed to communicate with the target device and is transparent to the user making it easier to use TFTP.

Run the program – Enter the device IP address, browse for the .hex file location and click on “UPLOAD” – you will be notified upon successful data transfer. The unit will re-program itself and re-boot with the new software and changes.

Security has been added if the connection is lost while uploading to the unit it will ignore the TFTP session.